# CERAMIC ABSTRACTS

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**Mueller, W. M., Mallett, G. R., and Fay, M. J.** (editors). Advances in X-Ray Analysis (Vol. 7) [Proceedings of the] Twelfth Annual Conference on Applications of X-Ray Analysis, August 1963, Denver, B (1) 29*j*.
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# Master and Doctor Theses in Ceramics for the Year Ending August 1965

| Name | Degree | Title |
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| [12]Allen, Walter C. | Ph.D. | Solid solution in the refractory magnesium spinels. |
| [3]Arens, James S. | M.S. | Strain aging in rutile ($TiO_2$). |
| [14]Arkayn, Hatay | M.S. | Determination of the glassy phase in ceramic bodies. |
| [7]Arko, Anthony C. | Ph.D. | Creep deformation of crystals, particularly phenomena at liquid helium temperatures. |
| [17]Baker, Robert J. | Ph.D. | Phase equilibria studies in the system $MgO–Al_2O_3–ZrO_2$. |
| [2]Bapna, M. S. | M.S. | Preparation of thin sections of rutile for transmission electron microscopy. |
| [3]Baukus, James P. | M.S. | Electrical conductivity of nonstoichiometric rutile single crystals from 1000° to 1500°C. |
| [4]Beasley, Wayne M. | S.M. | Sintering of strontium titanate. |
| [13]Bentzien, Dwayne C. | M.A. | Copper red glaze decoration of porcelain ceramic forms. |
| [15]Blank, Bette H. | Ph.D. | Kinetics of vaporization of aluminum nitride and magnesium nitride. |
| [10]Booth, Charles L. | Ph.D. | Melting history effects in lithium-potassium silicate glasses. |
| [15]Borom, Marcus P. | Ph.D. | Kinetics of the dissolution and diffusion of the oxides of iron by sodium disilicate glass. |
| [17]Bremser, Albert H. | M.S. | Phosphate bonded zirconia. |
| [10]Brown, Jesse J., Jr. | Ph.D. | Solid state reactions and thermal expansion of phases in systems containing ZnO and selected oxides of the groups IV and V elements. |
| [7]Buch, James | M.S. | Internal friction in rutile. |
| [14]Burdick, Vernon L. | M.S. | Coordination of aluminum in tricalcium aluminate. |
| [10]Caporali, Ronald V. | M.S. | Volume changes in some mixed-alkali silicate glasses and their influence on the mixed-alkali effect. |
| [18]Chao, Hung-Chi | Ph.D. | Deformation of oriented MnS inclusions. |
| [6]Choi, Dong M. | Ph.D. | Flow and fracture of hot-pressed polycrystalline spinel at elevated temperatures. |
| [3]Chun, John S. | M.S. | Thermoluminescence of three metal oxides in the temperature range 83° to 300°K. |
| [17]Cocagne, Charles J. | M.S. | Mixed materials analysis by combined density separation and chemical techniques. |
| [22]Cox, W. L. | M.S. | Crystal structure investigation of $La_2Te_3$ and NdTe. |
| [6]Davis, M. Paul | Ph.D. | High temperature mechanical behavior of pressure sintered alumina bicrystals. |
| [15]De Poorter, Gerald L. | Ph.D. | Kinetics of the high temperature-low pressure tungsten-nitrous oxide reaction. |
| [6]Derbyshire, Stephen W. | M.S. | Effect of microstructure on the electrical properties of polycrystalline barium titanate. |
| [9]Dietz, Earl D. | Ph.D. | Study of the superheating of albite. |
| [20]Drennan, John A. | Ph.D. | Bloating mechanism of the Lower Ecca shales. |
| [23]Eastman, Paul F. | Ph.D. | Water vapor effects on the initial sintering of magnesia. |
| [7]Eror, Nicholas G. | Ph.D. | Electrical conductivity and thermogravimetric studies on CoO, NiO, and MnO. |
| [4]Farnsworth, Phillip L. | Sc.D. | Deformation and fracture of silicon carbide. |
| [14]Felton, Duane A. | M.S. | Internal friction studies of National Bureau of Standards No. 710 glass. |
| [4]Ghosh-Tagore, Rathindra N. | Sc.D. | Self-diffusion in silicon carbide. |
| [9]Glander, Frederick R. | M.S. | Improving the resistance of vitrified floor tile to high velocity stresses. |
| [9]Goodyear, John K. | M.S. | Kinetic study of a nonequilibrium approach to vitrified polycrystalline ceramics. |
| [9]Goodyear, Michael U. | M.S. | Thermal reactions for low shrinkage porcelains. |
| [9]Graham, Henry C. | Ph.D. | Particle size dependence of electrical properties in low shrinkage porcelains. |
| [17]Greenberg, Charles B. | Ph.D. | Interfacial reactions in lead oxide bearing enamel–metal systems. |
| [12]Grossman, David G. | M.S. | X-ray investigation of metastable immiscibility in the cadmium borate system. |
| [14]Guile, Donald L. | Ph.D. | Investigation of the dielectric properties of single-crystal versus polycrystalline materials. |
| [22]Haase, D. J. | Ph.D. | Investigation of the erbium–selenium and the erbium–tellurium systems. |

| Name | Degree | Title |
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| [25]Hackney, Howard U. | M.S. | Behavior of the dry properties of a ceramic system. |
| [11]Hakim, Raymond M. | M.S. | Semiconducting oxide glasses. |
| [23]Harvey, Malcolm R. | Ph.D. | Kinetics of oxidation of boron carbide and boron in oxygen. |
| [2]Head, Clarence M. | M.S. | Effect of radiation damage on the formation of mullite in kaolinite. |
| [15]Hogg, Richard | M.S. | Theory of mutual coagulation of colloidal dispersions. |
| [5]Hurst, Robert D. | M.S. | Effect of reducing atmospheres on the mechanical properties of magnesite-chrome refractory brick. |
| [10]Hutchison, Charles R. | M.S. | Semidry pressing of Lower Kittanning clay. |
| [9]Ilkbay, Burhan | M.S. | Mathematical analysis of high velocity stress distribution on ceramic bodies. |
| *[1]Isenhour, John H., Jr. | M.S. | Roller-conveyor kiln for structural ceramic products. |
| [23]Jones, John T. | Ph.D. | Diffusion of manganese oxide in single crystals of periclase. |
| [21]Jones, Lewis O. | M.S. | Effect of grain structure on the magnetic properties of a low-loss polycrystalline nickel-zinc ferrite. |
| [7]Kenny, Neal S. | Ph.D. | Optical absorption of vanadium pentoxide. |
| [2]Koenig, Alan R. | M.S. | Determination of the coefficient of thermal expansion and Young's modulus of elasticity of high lead glass. |
| [17]Liedberg, Donald J. | M.S. | Metastable immiscibility in the system $PbO–B_2O_3$. |
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| [9]Moore, William T. | M.S. | Study of the influence of alumina on the laminating properties of glass. |
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| [9]Niesz, Dale E. | Ph.D. | Effect of porosity on the strength of a sintered glass powder. |
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| [11]Secrist, Duane R. | Ph.D. | Vapor phase formation of oxides by glow discharge. |
| [4]Shaw, Robert R. | S.M. | Levitation processing in ceramic system. |
| [9]Shell, James A. | M.S. | Low shrinkage barium silicate-kyanite porcelains. |
| [7]Shepela, Adam | M.S. | High pressure polymorphism of the alkali metal fluorides. |
| [21]Shih, Chi-Kai | Ph.D. | Study of the infrared spectra of metaphosphate glasses. |

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| [14]Slack, Lyle H. | Ph.D. | Semiconducting and associated properties of a progressively crystallized infrared transmitting glass. |
| [1]Smoak, John F. | M.S. | Coloring mechanism in structural clay products. |
| [23]Snow, Gary S. | Ph.D. | Dielectric loss in MgO and sapphire. |
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| [18]Thorne, John | M.S. | Electron micrographic study of magnesioferrite. |
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| [7]Wolfson, Robert G. | Ph.D. | Precipitation in NaCl–KCl mixed crystals. |
| [23]Wood, David W. | Ph.D. | Electrical conductivity of materials under high pressure. |
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| [14]Yu, Leonardo | M.S. | Study of screw stirrers in a model forehearth. |

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